

## WHAT IS CLAIMED IS:

1. A method for measuring an output multiplexer (OMUX) transfer function, comprising:
  - receiving a broadcast downlink signal from a satellite;
  - demodulating the broadcast downlink signal;
  - remodulating the demodulated signal; and
  - comparing the received broadcast downlink signal to the remodulated signal to estimate the OMUX transfer function of the satellite.
2. The method of claim 1, wherein the steps are performed by a receiver.
3. The method of claim 1, wherein input multiplexor effects are negligible.
4. The method of claim 1, wherein the remodulating includes accounting for traveling wave tube amplifier (TWTA) maps.
5. The method of claim 1, wherein the estimated OMUX transfer function comprises a ratio of the received broadcast downlink signal to the remodulated signal.
6. The method of claim 1, wherein the received broadcast downlink signal comprises an estimated OMUX output due to noise.
7. The method of claim 1, wherein the estimated OMUX transfer function includes bandwidth, flatness, and group delay.

8. The method of claim 1, further comprising utilizing the estimated OMUX transfer function to assist to layered modulation signal processing.

9. The method of claim 1, further comprising utilizing the estimated OMUX transfer function as part of satellite payload system monitoring.

10. An apparatus for measuring an output multiplexer (OMUX) transfer function, comprising:

means for receiving a broadcast downlink signal from a satellite;

means for demodulating the broadcast downlink signal;

means for remodulating the demodulated signal; and

means for comparing the received broadcast downlink signal to the remodulated signal to estimate the OMUX transfer function of the satellite.

11. The apparatus of claim 10, wherein the apparatus comprises a receiver.

12. The apparatus of claim 10, wherein input multiplexor effects are negligible.

13. The apparatus of claim 10, wherein the means for remodulating includes means for accounting for traveling wave tube amplifier (TWTA) maps.

14. The apparatus of claim 10, wherein the estimated OMUX transfer function comprises a ratio of the received broadcast downlink signal to the remodulated signal.

15. The apparatus of claim 10, wherein the received broadcast downlink signal comprises an estimated OMUX output due to noise.

16. The apparatus of claim 10, wherein the estimated OMUX transfer function includes bandwidth, flatness, and group delay.

17. The apparatus of claim 10, further comprising means for utilizing the estimated OMUX transfer function to assist to layered modulation signal processing.

18. The apparatus of claim 10, further comprising means for utilizing the estimated OMUX transfer function as part of satellite payload system monitoring.

19. A system for measuring an output multiplexer (OMUX) transfer function, comprising:

a downlink signal broadcast from a satellite;

a receiver configured to receive the downlink signal;

a demodulator within the receiver configured to demodulate the downlink signal;

a remodulator within the receiver configured to remodulate the demodulated signal;

and

a comparator configured to compare the received downlink signal to the remodulated signal to estimate the OMUX transfer function of the satellite.

20. The system of claim 19, wherein input multiplexor effects are negligible.

21. The system of claim 19, wherein the remodulator accounts for traveling wave tube amplifier (TWTA) maps.

22. The system of claim 19, wherein the estimated OMUX transfer function comprises a ratio of the received broadcast downlink signal to the remodulated signal.

23. The system of claim 19, wherein the downlink signal received by the receiver comprises an estimated OMUX output due to noise.

24. The system of claim 19, wherein the estimated OMUX transfer function includes bandwidth, flatness, and group delay.

25. The system of claim 19, further comprising a layered modulation module configured to utilize the estimated OMUX transfer function to assist to layered modulation signal processing.

26. The system of claim 19, further comprising a system monitoring module configured to utilize the estimated OMUX transfer function as part of satellite payload system monitoring.